Nama: ..... Kelas: ..... Tarikh: .....

KERTAS MODEL SPM

KERTAS 1 — Satu jam tiga puluh minit

Kertas peperiksaan ini mengandungi **40** soalan. Jawab **semua** soalan. Bagi setiap soalan, pilih **satu** jawapan sahaja daripada pilihan **A**, **B**, **C** dan **D**. Anda dibenarkan menggunakan kalkulator saintifik.
This question paper consists of 40 *questions. Answer* all *the questions. For each question, choose only* one *answer from the options,* A, B, C *and* D. *You may use a scientific calculator.*

1. Bundarkan 0.023456 betul kepada tiga angka bererti.
Round off 0.023456 *correct to three significant figures.*

A 0.023
B 0.0230
C 0.0234
D 0.0235

2. Ungkapkan 4.18×10^{-2} sebagai satu nombor tunggal.
Express 4.18×10^{-2} *as a single number.*

A 0.418
B 0.0418
C 0.00418
D 0.000418

3. $8\ 000 \times 2.05 \times 10^{-9} =$

A 1.64×10^{4}
B 1.64×10^{5}
C 1.64×10^{-4}
D 1.64×10^{-5}

4. Ungkapkan 243_5 sebagai nombor dalam asas tujuh.
Express 243_5 *as a number in base seven.*

A 33_7
B 73_7
C 133_7
D 331_7

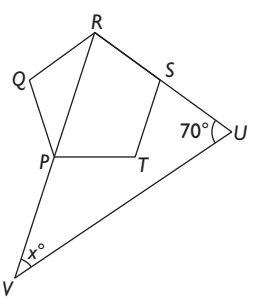
5. Luas sebuah padang berbentuk segi empat tepat ialah 9.9×10^3 m^2. Lebar padang itu ialah 9 000 cm. Hitung panjang, dalam cm, padang itu.
The area of a rectangular field is 9.9×10^3 m^2. *The width of the field is* 9 000 cm. *Calculate the length, in* cm, *of the field.*

A 1.1×10^{3}
B 1.1×10^{4}
C 1.1×10^{5}
D 1.1×10^{6}

6. $1322_4 - 303_4 =$

A 1013_4
B 1023_4
C 1103_4
D 1123_4

7. Dalam Rajah 1, *PQRST* ialah sebuah pentagon sekata. *RSU* dan *RPV* ialah garis lurus.
In Diagram 1, *PQRST is a regular pentagon. RSU and RPV are straight lines.*

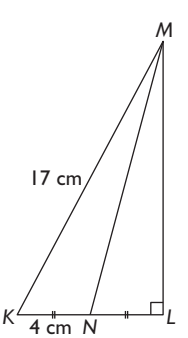


Rajah 1/*Diagram* 1

Cari nilai *x*.
Find the value of x.

A 36
B 38
C 50
D 72

8. Dalam Rajah 2, *KLM* ialah segi tiga bersudut tegak dan *KN* = *NL*.
In Diagram 2, *KLM is a right-angled triangle and KN = NL.*

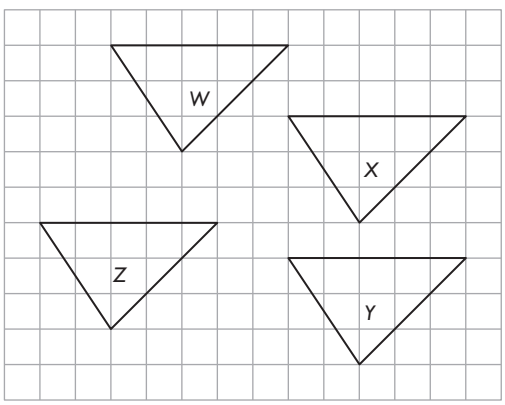


Rajah 2/*Diagram* 2

Hitung panjang *MN*, dalam cm.
Calculate the length of MN, in cm.

A 11.0
B 15.5
C 16.5
D 19.0

9. Rajah 3 menunjukkan empat segi tiga, *W*, *X*, *Y* dan *Z*, yang dilukis pada grid segi empat sama.
Diagram 3 shows four triangles, W, X, Y and Z, drawn on a grids of squares.

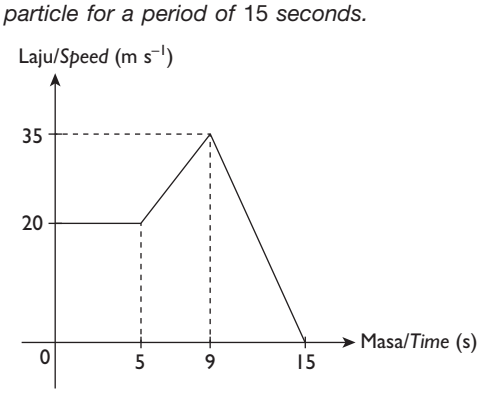


Rajah 3/*Diagram 3*

Antara berikut, yang manakah translasi yang betul?
Which of the following is the correct translation?

	Objek *Object*	Image *Imej*	Vector of translation *Vektor translasi*
A	*W*	*X*	$\begin{pmatrix}5\\2\end{pmatrix}$
B	*X*	*Y*	$\begin{pmatrix}0\\4\end{pmatrix}$
C	*Y*	*Z*	$\begin{pmatrix}-2\\1\end{pmatrix}$
D	*Z*	*W*	$\begin{pmatrix}2\\5\end{pmatrix}$

10. Rajah 4 menunjukkan graf laju-masa bagi pergerakan suatu zarah dalam tempoh 15 saat.
Diagram 4 shows a speed-time graph for the movement of a particle for a period of 15 seconds.

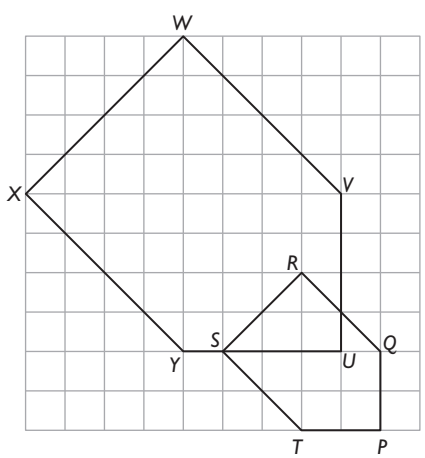


Rajah 4/*Diagram 4*

Hitung jumlah jarak, dalam m, yang dilalui oleh zarah itu dalam 10 saat terakhir.
Calculate the total distance, in m, travelled by the particle in the last 10 seconds.

A 215
B 347.5
C 450
D 452.5

11. Dalam Rajah 5, pentagon *PQRST* ialah imej kepada pentagon *UVWXY* di bawah suatu pembesaran dengan faktor skala *k*.
In Diagram 5, pentagon PQRST is the image of pentagon UVWXY under an enlargement with scale factor k.



Rajah 5/*Diagram 5*

Nyatakan nilai *k*.
State the value of k.

A $\frac{1}{3}$
B $\frac{1}{2}$
C 2
D 3

12. Rajah 6 menunjukkan satu set data.
Diagram 6 shows a set of data.

4	4	2	1	4	1	1	3
1	0	0	4	1	1	4	5

Rajah 6/*Diagram 6*

Cari median bagi data itu.
Find the median of the data.

A 2.5
B 2.0
C 1.5
D 1.0

13. Jadual 1 menunjukkan bilangan majalah yang dijual di sebuah kedai dalam masa satu minggu.
Table 1 shows the number of magazines sold by a shop in a week.

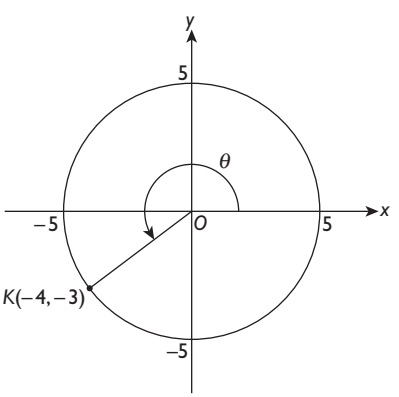
Hari *Days*	**Bilangan majalah** *Number of magazines*
Ahad & Isnin *Sunday & Monday*	$p + 5$
Selasa & Rabu *Tuesday & Wednesday*	12
Khamis & Jumaat *Thursday & Friday*	$2p$
Sabtu *Saturday*	5

Jadual 1/*Table 1*

Min bagi bilangan majalah yang dijual dalam sehari ialah 4. Cari nilai p.
The mean of the number of the magazines sold in a day is 4. Find the value of p.

A 1
B 1.5
C 2
D 4

14. Rajah 7 menunjukkan sebuah bulatan berpusat pada asalan O, yang dilukis pada suatu satah Cartes.
Diagram 7 shows a circle with centre at the origin O, drawn on a Cartesian plane.



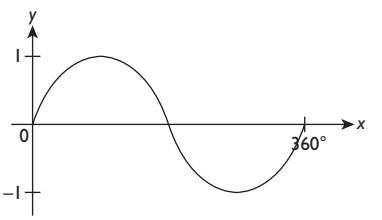
Rajah 7/*Diagram 7*

Cari nilai kos θ.
Find the value of cos θ.

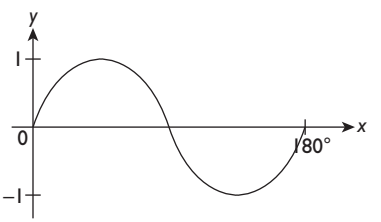
A $-\frac{4}{5}$
B $-\frac{3}{5}$
C $\frac{3}{5}$
D $\frac{4}{5}$

15. Antara berikut, yang manakah mewakili graf $y = \sin x$?
Which of the following represents the graph of $y = \sin x$?

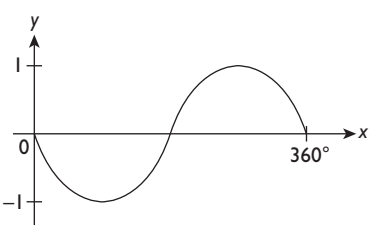
A



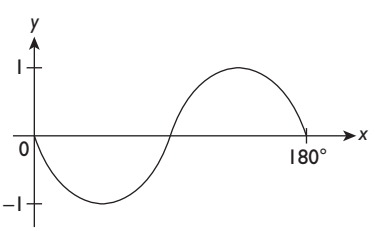
B



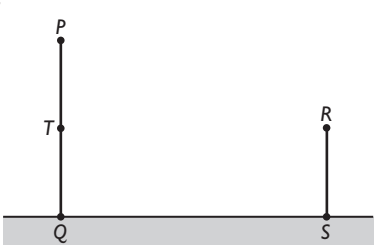
C



D



16. Dalam Rajah 8, PQ dan RS ialah dua batang tiang tegak pada satah mengufuk. T ialah satu titik pada tiang PQ dengan keadaan $TQ = RS$.
In Diagram 8, PQ and RS are two vertical poles on a horizontal plane. T is a point on pole PQ such that TQ = RS .

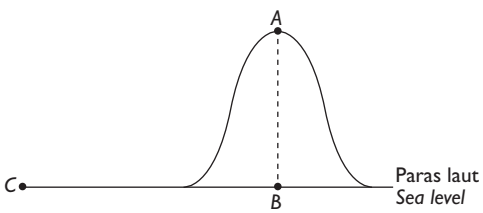


Rajah 8/*Diagram 8*

Namakan sudut dongak titik P dari titik R.
Name the angle of elevation of point P from point R.

A $\angle PRT$
B $\angle RPT$
C $\angle QRT$
D $\angle QRP$

17. Rajah 9 menunjukkan sebuah bukit dengan tinggi mencancang AB, 1 000 m dari paras laut. Jarak dari B ke C ialah 1 500 m.
Diagram 9 shows a hill with a vertical height of AB, 1 000 m above sea level. The distance from B to C is 1 500 m.



Rajah 9/*Diagram 9*

Hitung sudut tunduk C dari A.
Calculate the angle of depression of C from A.

A 33.69°
B 41.81°
C 48.19°
D 56.30°

18. $(x - 2)^2 - x(x - 5) =$
A $x + 4$
B $x - 4$
C $-x + 4$
D $-x - 4$

19. Ungkapkan $\frac{3}{2h} - \frac{2 - h}{h^2}$ sebagai satu pecahan tunggal dalam bentuk termudah.
Express $\frac{3}{2h} - \frac{2 - h}{h^2}$ *as a single fraction in its simplest form.*

A $\frac{h - 2}{2h^2}$
B $\frac{2h - 4}{2h^2}$
C $\frac{4h - 2}{2h^2}$
D $\frac{5h - 4}{2h^2}$

20. Jadual 2 menunjukkan kadar cukai jalan motosikal dan kereta persendirian di Semenanjung Malaysia.
Table 2 shows the road tax rates for motorcycles and private cars in Peninsular Malaysia.

Kapasiti enjin *Engine capacity*	**Kadar cukai jalan**/*Road tax rate*	
	Kadar asas *Base rate*	**Kadar progresif** *Progressive rate*
Kadar cukai jalan motosikal/*Motorcycle road tax rate*		
150 cc dan ke bawah/*and below*	Percuma/*Free*	
151 cc – 200 cc	RM30	–
201 cc – 250 cc	RM50	–
Kadar cukai jalan kereta persendirian/*Private car road tax rate*		
1 401 cc – 1 600 cc	RM90	–
1 601 cc – 1 800 cc	RM200	+ RM0.40 setiap cc melebihi 1 600 cc + RM0.40 *each* cc *exceeding* 1 600 cc
1 801 cc – 2 000 cc	RM280	+ RM0.50 setiap cc melebihi 1 800 cc + RM0.50 *each* cc *exceeding* 1 800 cc
2 001 cc – 2 500 cc	RM380	+ RM1.00 setiap cc melebihi 2 000 cc + RM1.00 *each* cc *exceeding* 2 000 cc

Jadual 2/*Table 2*

Khairil mempunyai sebuah motosikal dan sebuah kereta dengan kapasiti enjin masing-masing ialah 210 cc dan 1 990 cc. Hitung jumlah cukai jalan bagi kedua-dua kenderaannya.
Khairil has a motorcycle and a car with the engine capacity of 210 cc and 1 990 cc respectively. Calculate the total road tax for both of his vehicles.

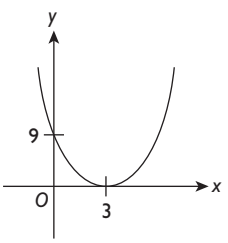
A RM145
B RM330
C RM406
D RM425

21. Encik Asri mempunyai polisi insurans perubatan dengan deduktibel sebanyak RM20 000 setahun dengan had tahunan bernilai RM250 000. Pada tahun ketiga dalam tempoh insuransnya, Encik Asri telah dikenakan kos rawatan buah pinggan sebanyak RM130 000. Hitung jumlah kos yang perlu ditanggung oleh syarikat insurans.
Encik Asri has a medical insurance policy with a deductible of RM20 000 *per year with an annual limit of* RM250 000. *In the third year of his insured policy, Encik Asri underwent kidney treatment and the cost was* RM130 000. *Calculate the amount borne by insurance company.*

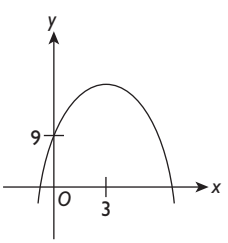
A RM0
B RM20 000
C RM110 000
D RM120 000

22. Antara graf berikut, yang manakah mewakili $f(x) = 9 - 6x + x^2$?
Which of the following graphs represents $f(x) = 9 - 6x + x^2$?

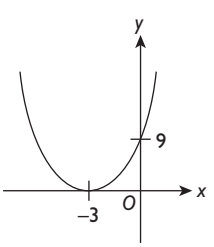
A



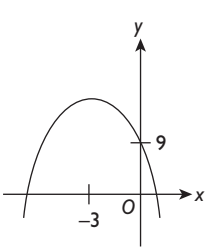
B



C



D



23. Diberi $2T = \sqrt{\dfrac{T - 3M}{M}}$, ungkapkan M dalam sebutan T.
Given $2T = \sqrt{\dfrac{T - 3M}{M}}$, *express* M *in terms of* T.

A $M = \dfrac{T}{2T^2 - 3}$

B $M = \dfrac{T}{2T^2 + 3}$

C $M = \dfrac{T}{4T^2 - 3}$

D $M = \dfrac{T}{4T^2 + 3}$

24. Garis lurus $y = -3x + 10$ dan $y = -px + 6$ bersilang pada titik $(2, q)$. Cari nilai p.
The straight lines $y = -3x + 10$ *and* $y = -px + 6$ *are intersect at point* $(2, q)$. *Find the value of* p.

A -1
B -4
C 1
D 4

25. $\left(\dfrac{8}{x^3}\right)^{-\frac{2}{3}} =$

A $4x^2$
B $\dfrac{x^2}{4}$
C $\dfrac{x^2}{2}$
D $\dfrac{2}{x^2}$

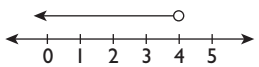
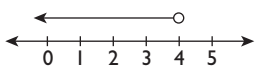
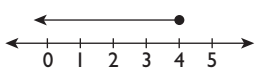
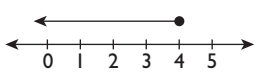
26. $\left(\dfrac{16}{m^8}\right)^{\frac{1}{4}} \times \mathrm{m}^{-3} =$

A $2m^{-5}$
B $4m^{-5}$
C $2m^5$
D $4m^5$

27. Antara berikut, yang manakah pernyataan benar?
Which of following is a true statement?

A $5^0 = 1$
B $13 \times 2 = 3 \times 13$
C 49 ialah nombor perdana.
49 *is a prime number.*
D Semua sudut cakah kurang daripada 90°.
All obtuse angles are less than 90°.

28. Garis nombor manakah yang mewakili penyelesaian bagi ketaksamaan linear yang diberi?
Which number line represents the solution for the given linear inequality?

	Ketaksamaan linear *Linear inequality*	**Penyelesaian** *Solution*
A	$2x - 3 \leqslant 5$	
B	$2x - 5 < 4$	
C	$x + 4 \geqslant 8$	
D	$3 - x \geqslant -1$	

29. Senaraikan semua integer x yang memuaskan kedua-dua ketaksamaan linerar serentak $4 + x \geqslant 1$ dan $-\frac{1}{4}x > -1$.
List all the integers x which satisfy both the simultaneous linear inequalities $4 + x \geqslant 1$ *and* $-\frac{1}{4}x > -1$.

A $-2, -1, 0, 1, 2, 3$
B $-2, -1, 0, 1, 2, 3, 4$
C $-3, -2, -1, 0, 1, 2, 3$
D $-3, -2, -1, 0, 1, 2, 3, 4$

30. Jadual 3 menunjukkan taburan skor sekumpulan murid dalam suatu ujian.
Table 3 *shows the distribution of scores of a group of pupils in a test.*

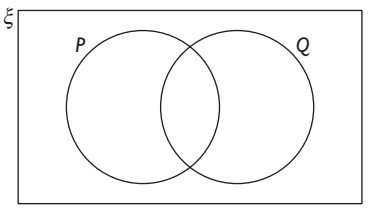
Skor *Score*	10	20	30	40	50
Kekerapan × Skor *Frequency × Score*	110	140	150	0	100

Jadual 3/*Table* 3

Cari mod bagi skor itu.
Find the mode of the score.

A 10
B 20
C 30
D 50

31. Rajah 10 ialah gambar rajah Venn yang menunjukkan set semesta ξ, set P dan set Q.
Diagram 10 *is a Venn diagram showing the universal set* ξ, *set P and set Q.*



Rajah 10/*Diagram* 10

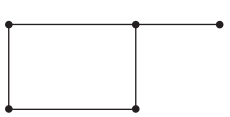
Rantau $(P \cup Q)'$ setara dengan rantau
The region $(P \cup Q)'$ *is equivalent to the region*

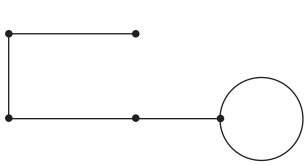
A $P \cup Q'$
B $P \cap Q'$
C $P' \cup Q'$
D $P' \cap Q'$

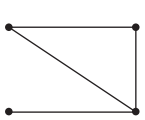
32. Antara bilangan darjah berikut, yang manakah boleh dilukis sebagai satu graf?
Which of the following sum of degrees can be drawn as a graph?

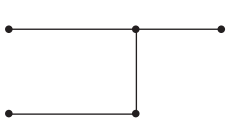
A 2, 2, 1, 1, 3
B 3, 3, 1, 2, 4
C 2, 2, 3, 1, 4
D 1, 1, 3, 4, 2

33. Antara berikut, yang manakah suatu pokok?
Which of the following is a tree?

A


B


C


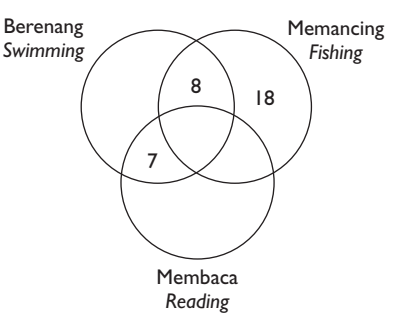
D


34. Jadual 4 menunjukkan data yang diperoleh daripada satu kaji selidik ke atas 80 orang murid mengenai hobi mereka. Rajah 11 ialah gambar rajah Venn yang mewakili sebahagian daripada maklumat dalam Jadual 4.

Table 4 shows the data obtained from a survey of 80 pupils about their hobbies. Diagram 11 is a Venn diagram that represents part of the information in Table 4.

Hobi *Hobby*	**Bilangan murid** *Number of pupils*
Berenang *Swimming*	36
Memancing *Fishing*	46
Berenang dan memancing sahaja *Swimming and fishing only*	8
Berenang dan membaca sahaja *Swimming and reading only*	7
Berenang sahaja *Swimming only*	15
Memancing sahaja *Fishing only*	18

Jadual 4/*Table 4*



Rajah 11/*Diagram 11*

Hitung bilangan murid yang gemar berenang atau memancing dan juga membaca.

Calculate the number of pupils who like swimming or fishing and also reading.

A 27
B 33
C 35
D 47

35. Sebuah kotak berisi 5 biji guli merah dan 15 biji guli kuning. Ali memasukkan 3 guli merah dan 2 biji guli hijau lagi ke dalam kotak itu. Sebiji guli dikeluarkan secara rawak daripada kotak itu. Apakah kebarangkalian sebiji guli merah dikeluarkan?

A box contains 5 red marbles and 15 yellow marbles. Ali puts another 3 red marbles and 2 green marbles into the box. A marble is drawn randomly from the box. What is the probability that a red marble is drawn?

A $\frac{1}{5}$
B $\frac{1}{4}$
C $\frac{2}{5}$
D $\frac{8}{25}$

36. Chong telah menguji x set alat elektronik bagi syarikatnya dan mendapati 16 set mengalami kerosakan. Kebarangkalian mendapat satu set alat yang rosak ialah $\frac{1}{30}$. Hitung nilai x.

Chong has tested x sets of electronic devices in his company and found that 16 sets are defected. The probability of getting a defect set is $\frac{1}{30}$. Calculate the value of x.

A 460
B 480
C 520
D 600

37. Diberi bahawa $r \propto \frac{1}{t^2}$ dan $r = 81$ apabila $t = \frac{1}{3}$. Hitung nilai r apabila $t = 3$.

It is given that $r \propto \frac{1}{t^2}$ and $r = 81$ when $t = \frac{1}{3}$. Calculate the value of r when $t = 3$.

A 1
B 3
C 9
D 81

38. Jadual 5 menunjukkan dua set bagi nilai p, q dan r yang memuaskan $r \propto \frac{p}{q}$.

Table 5 shows two sets of values of p, q and r which satisfy $r \propto \frac{p}{q}$.

p	10	5
q	6	4
r	8	w

Jadual 5/*Table 5*

Hitung nilai w.
Calculate the value of w.

A 4.8
B 6.0
C 7.2
D 8.4

39. $\begin{bmatrix} -1 \\ 4 \end{bmatrix} - \frac{1}{2}\begin{bmatrix} 8 \\ -2 \end{bmatrix} + \begin{bmatrix} 3 \\ -5 \end{bmatrix} =$

A $\begin{bmatrix} 6 \\ -3 \end{bmatrix}$

B $\begin{bmatrix} 6 \\ 0 \end{bmatrix}$

C $\begin{bmatrix} -2 \\ 0 \end{bmatrix}$

D $\begin{bmatrix} -2 \\ -3 \end{bmatrix}$

40. Diberi $\begin{bmatrix} 2 \\ p \end{bmatrix}[-3 \;\; 1] = \begin{bmatrix} -6 & 2 \\ 6 & -2 \end{bmatrix}$, hitung nilai p.

Given $\begin{bmatrix} 2 \\ p \end{bmatrix}[-3 \;\; 1] = \begin{bmatrix} -6 & 2 \\ 6 & -2 \end{bmatrix}$, *calculate the value of p.*

A 6 **B** 4
C −2 **D** −3

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER

Nama: ..... Kelas: ..... Tarikh: .....

KERTAS 2 **Dua jam tiga puluh minit**

Kertas peperiksaan ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**. Jawab **semua** soalan dalam **Bahagian A** dan **Bahagian B**. Jawab mana-mana **satu** soalan daripada **Bahagian C**. Tulis jawapan anda pada ruang yang disediakan dalam kertas peperiksaan ini. Tunjukkan kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah. Anda dibenarkan menggunakan kalkulator saintifik.

This question paper consists of three sections: ***Section*** **A**, ***Section*** **B** *and* ***Section*** **C**. *Answer* **all** *the questions in* ***Section*** **A** *and* ***Section*** **C.** Answer *any* **one** *question from* ***Section*** **C**. *Write your answers in the spaces provided in the question paper. Show your workings. It may help you to get marks. You may use a scientific calculator.*

Bahagian A
Section A

[40 *markah*/40 *marks*]

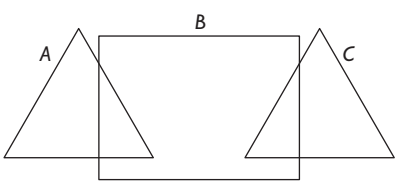
Jawab **semua** soalan dalam bahagian ini.
Answer **all** *the questions in this section.*

1. Gambar rajah Venn di ruang jawapan menunjukkan set A, B dan C. Diberi bahawa set semesta, $\xi = A \cup B \cup C$. Pada rajah di ruang jawapan, lorek
The Venn diagrams in the answer space show sets A, B and C. Given the universal set, $\xi = A \cup B \cup C$. On the diagrams provided in the answer space, shade

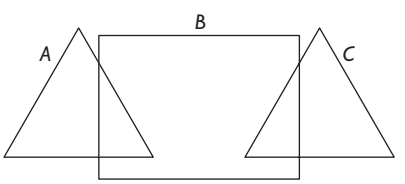
[3 *markah*/3 *marks*]

Jawapan/*Answer*:

(a) $B' \cap C$



(b) $A \cup (B \cap C)$



2. *Penyelesaian dengan kaedah matriks* ***tidak*** *dibenarkan untuk menjawab soalan ini.*
Solving using matrix method is **not** *allowed in this question.*
Hitung nilai x dan nilai y yang memuaskan persamaan linear serentak berikut:
Calculate the values of x and y that satisfy the following simultaneous linear equations:

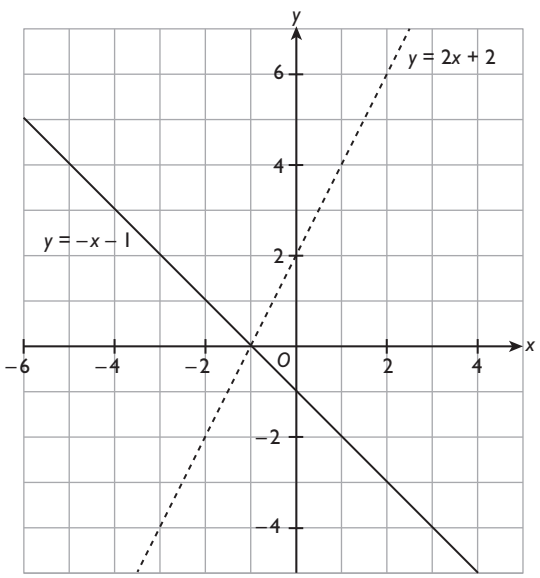
$$2x - 3y = 16$$
$$4x + y = -3$$

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

3. Pada graf di ruang jawapan, lorek rantau yang memuaskan ketiga-tiga ketaksamaan $y > 2x + 2$, $y \geqslant -x - 1$ dan $y \leqslant 4$.
On the graph in the answer space, shade the region which satisfies the three inequalities $y > 2x + 2$, $y \geqslant -x - 1$ *dan* $y \leqslant 4$.
[3 *markah*/3 *marks*]

Jawapan/*Answer*:



4. Sejak 5 tahun yang lalu, Puan Anisah telah menyimpan sebanyak RM15 000 di dalam akaun simpanannya dengan kadar faedah 4.5% setahun. Pelaburannya itu menerima faedah kompaun setiap 6 bulan sekali bagi setiap tahun.
Since 5 *years ago*, *Puan Anisah has saved* RM15 000 *in her savings account with an interest rate of* 4.5% *per annum. The investment receives compound interest every* 6 *months for each year.*

Hitung
Calculate

(a) jumlah simpanan Puan Anisah sehingga kini jika beliau tidak pernah membuat sebarang penambahan simpanan atau pengeluaran,
Puan Anisah's total savings to date if she has never made any additional savings or withdrawals,

(b) jumlah faedah kompaun yang diperolehnya.
the total compound interest earned by her.

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

(a)

(b)

5. (a) Nyatakan sama ada yang berikut adalah pernyataan atau bukan pernyataan.
State whether the following is a statement or not a statement.

$-5 + 3 < -4$

(b) Tulis songsangan bagi implikasi berikut dan seterusnya nyatakan sama ada songsangan itu adalah benar atau palsu.
Write down the inverse of the following implication and hence, state whether the inverse is true or false.

Jika $h < 4$, maka $5h - 4 < 16$.
If $h < 4$, *then* $5h - 4 < 16$.

(c) Diberi bahawa isi padu silinder ialah $\pi j^2 t$, dengan keadaan j ialah jejari dan t ialah tinggi. Buat satu kesimpulan secara deduksi tentang isi padu sebuah silinder dengan jejari 7 cm dan tinggi 10 cm.
It is given that the volume of a cylinder is $\pi j^2 t$, *where j is the radius and t is the height. Make one conclusion by deduction for the volume of a cylinder with radius* 7 cm *and height* 10 cm.

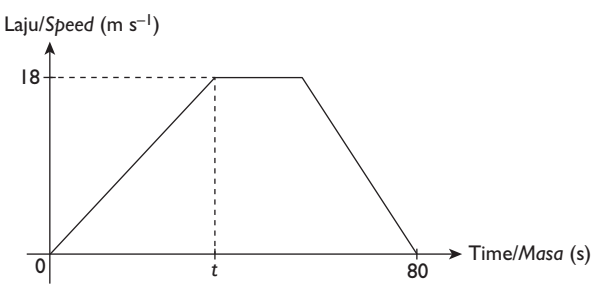
[5 *markah*/5 *marks*]

Jawapan/*Answer*:
(a)

(b)

(c)

6. Rajah 1 menunjukkan graf laju-masa bagi pergerakan suatu objek dalam tempoh 80 saat.
Diagram 1 *shows the speed-time graph for the movement of an object for a period of* 80 *seconds.*



Rajah 1/*Diagram* 1

(a) Nyatakan laju seragam, dalam m s^{-1}, objek itu.
State the uniform speed, in m s^{-1}, *of the object.*

(b) Kadar perubahan laju dalam t saat yang pertama ialah 0.5 m s^{-2}. Hitung nilai t.
The rate of change of speed in the first t seconds is 0.5 m s^{-2}. *Calculate the value of t.*

(c) Jumlah jarak yang dilalui dalam 80 saat ialah 855 meter. Hitung tempoh masa, dalam saat, yang diambil oleh objek itu untuk bergerak dengan laju seragam.
The total distance travelled in 80 *seconds is* 855 *metres. Calculate the period of time, in seconds, taken by the object to travel with the uniform speed.*

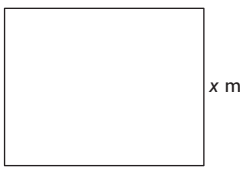
[5 *markah*/5 *marks*]

Jawapan/*Answer*:
(a)

(b)

(c)

7. Rajah 2 menunjukkan sebuah kolam renang berbentuk segi empat tepat dengan keluasan 285 m^2.
Diagram 2 shows a rectangular swimming pool with an area of 285 m^2.



Rajah 2/*Diagram* 2

Lebar kolam renang itu ialah x m. Panjangnya pula 4 m lebih daripada lebarnya. Hitung panjang, dalam m, kolam renang itu.
The width of the swimming pool is x m. *Its length is* 4 m *more than its width. Calculate the length, in* m, *of the swimming pool.*

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

8. Jadual 1 menunjukkan wang saku bagi 40 orang murid.
Table 1 *shows the pocket money of* 40 *pupils.*

Wang saku (RM) *Pocket money* (RM)	1	2	3	4	5	6
Bilangan murid *Number of pupils*	3	6	8	12	9	2

Jadual 1/*Table* 1

Hitung median dan julat antara kuartil bagi data itu.
Calculate the median and the interquartile range of the data.

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

9. Encik Husnin ingin membeli insurans kebakaran rumahnya. Nilai boleh insurans rumahnya itu ialah RM300 000. Jadual 2 menunjukkan polisi insurans yang disediakan oleh KN Insurance Sdn. Bhd.
Encik Husnin wants to buy fire insurance for his house. The insurable value of his house is RM300 000*. Table 2 shows the insurance policy provided by KN Insurance Sdn. Bhd.*

Polisi insurans kebakaran oleh KN Insurance Sdn. Bhd. ***Fire insurance policy by KN Insurance Sdn. Bhd.***	
Ko-insurans *Co-insurance*	80%
Deduktibel *Deductible*	RM4 000

Jadual 2/*Table* 2

(a) Hitung jumlah insurans yang perlu dibeli oleh Encik Husnin bagi rumahnya itu.
Calculate the amount of insurance need to buy by Encik Husnin for his house.

(b) Hitung bayaran pampasan yang diterima oleh Encik Husnin jika dia telah menginsuranskan rumahnya dengan jumlah RM180 000 dan rumahnya telah terbakar dengan jumlah kerugian sebanyak RM70 000.
Calculate the amount of compensation that Encik Husnin will receive if he insured his house at a sum of RM180 000 *and his house caught on fire with the amount of loss is* RM70 000*.*

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

(a)

(b)

10. Rajah 3 menunjukkan tujuh keping kad yang berlabel di dalam dua kotak.
Diagram 3 *shows seven labelled cards in two boxes.*

Rajah 3/*Diagram* 3

Sekeping kad dipilih secara rawak daripada setiap kotak itu.
A card is picked at random from each box.

(a) Senaraikan semua kesudahan yang mungkin bagi ruang sampel ini.
List all the possible outcomes for this sample space.

(b) Dengan menyenaraikan semua kesudahan yang mungkin bagi peristiwa itu, cari kebarangkalian bahawa kad-kad yang dipilih itu bermula dengan huruf E atau kedua-dua kad itu dilabel dengan huruf vokal.
By listing all the possible outcomes of the events, find the probability that the cards picked start with the letter E or both cards are labelled with vowels.

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

(a)

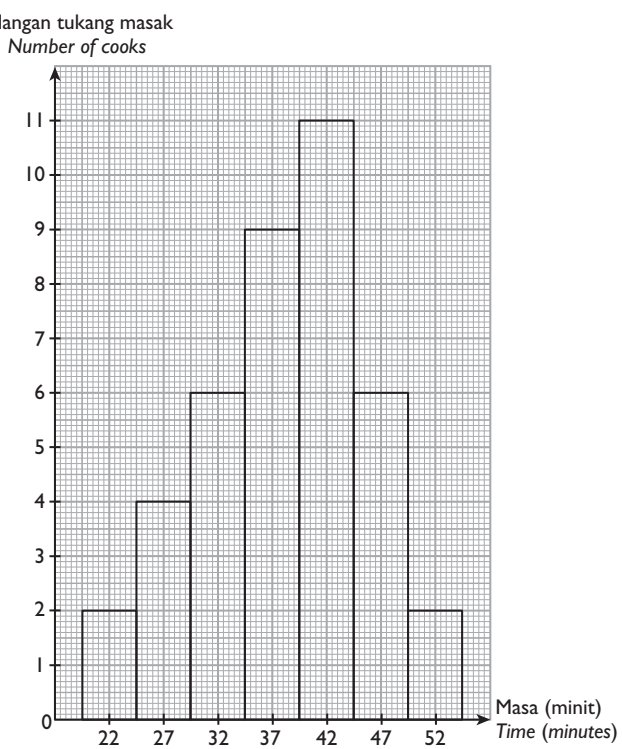
(b)

Bahagian B
Section B

[45 *markah*/45 *marks*]

Jawab **semua** soalan dalam bahagian ini.
Answer **all** *the questions in this section.*

11. Rajah 4 ialah histogram yang menunjukkan masa, dalam minit, yang diambil oleh sekumpulan tukang masak bagi menyiapkan tugasan dalam suatu pertandingan memasak.
Diagram 4 *is a histogram showing the time, in minutes, taken by a group of cooks to complete an assignment in a cooking competition.*



Rajah 4/*Diagram* 4

(a) Berdasarkan Rajah 4, lengkapkan jadual di ruang jawapan.
Based on Diagram 4, *complete the table in the answer space.*

[5 *markah*/5 *marks*]

(b) Hitung min anggaran masa, dalam minit, yang diambil oleh seorang tukang masak.
Calculate the estimated mean time, in minutes, taken by a cook.

[3 *markah*/3 *marks*]

(c) Hitung sisihan piawai bagi data itu.
Calculate the standard deviation of the data.

[2 *markah*/2 *marks*]

Jawapan/*Answer*:

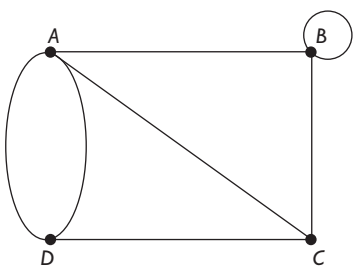
(a)

Masa (minit) *Time (minutes)*	**Kekerapan** *Frequency* f	**Titik tengah** *Midpoint* x	fx	x^2	fx^2
15 – 19	0	17			
20 – 24					
25 – 29					
30 – 34					
35 – 39					
40 – 44					
45 – 49					
50 – 54					

(b)

(c)

12. (a)



Rajah 5.1/*Diagram* 5.1

Rajah 5.1 menunjukkan satu graf yang mempunyai gelung dan berbilang tepi. Berdasarkan Rajah 5.1, nyatakan
Diagram 5.1 *shows a graph consists of a loop and multiple edges. Based on Diagram* 5.1, *determine*

(i) set tepi, E,
set of edges, E,

(ii) jumlah darjah.
sum of degrees.

[3 *markah*/3 *marks*]

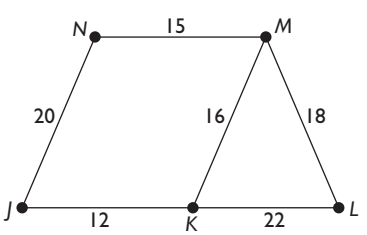
(b) Dalam rajah di ruang jawapan, titik P, Q, R, S, T dan U ialah enam bucu bagi suatu graf terarah. Diberi set bucu, V, dan set tepi, E, seperti berikut:
In the diagram in the answer space, points P, Q, R, S and T are six vertices of a directed graph. Given the set of vertices, V, and the set of edges, E, are as follows:

$V = \{P, Q, R, S, T, U\}$
$E = \{(Q, R), (R, S), (S, S), (S, P), (S, Q), (S, U), (T, S), (T, U), (U, U)\}$

Lukis graf terarah berdasarkan maklumat di atas.
Draw a directed graph based on the above information.

[2 *markah*/2 *marks*]

(c)



Rajah 5.2/*Diagram* 5.2

Rajah 5.2 menunjukkan satu graf tak terarah dan berpemberat. Lukis satu pokok dengan jumlah pemberat minimum.
Diagram 5.2 *shows an undirected weighted graph. Draw a tree with a minimum total weight.*

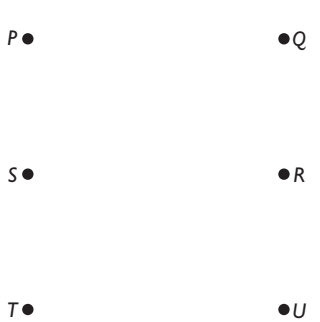
[4 *markah*/4 *marks*]

Jawapan/*Answer*:

(a) (i)

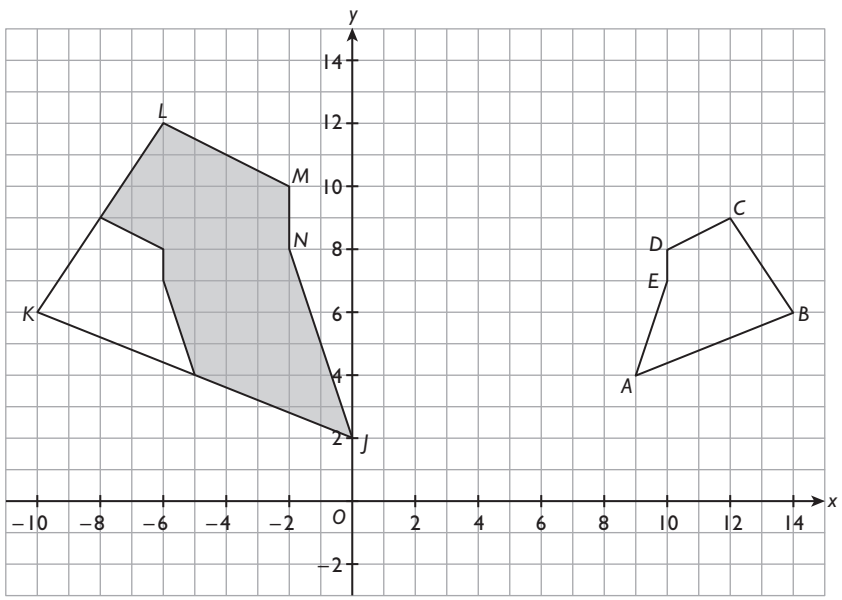
(ii)

(b)



(c)

13. Rajah 6 menunjukkan dua buah pentagon, *ABCDE* dan *JKLMN*, dilukis pada satu satah Cartes.
Diagram 6 shows two pentagons, ABCDE and JKLMN, drawn on a Cartesian plane.



Rajah 6/*Diagram 6*

Tranformasi **T** ialah satu translasi $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$.
Tranformasi **P** ialah pantulan pada garis $y = 4$.
Tranformasi **R** ialah putaran 90° ikut arah jam pada pusat *N*.
Transformation **T** *is a translation* $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$.
Transformation **P** *is a reflection in the line* $y = 4$.
Transformation **R** *is a clockwise rotation of* 90° *about the centre N.*

(a) Nyatakan koordinat imej bagi titik *J* di bawah tranformasi berikut:
State the coordinates of the image of point J under the following transformations:
(i) $\mathbf{T}^2$ (ii) **PR**

[4 *markah*/4 *marks*]

(b) Pentagon *JKLMN* ialah imej bagi pentagon *ABCDE* di bawah gabungan tranformasi **VU**. Huraikan selengkapnya tranformasi
Pentagon JKLMN is the image of pentagon ABCDE under the combined transformation **VU**. *Describe in full, the transformation*
(i) **U** (ii) **V**

[5 *markah*/5 *marks*]

Jawapan/*Answer*:
(a) (i)

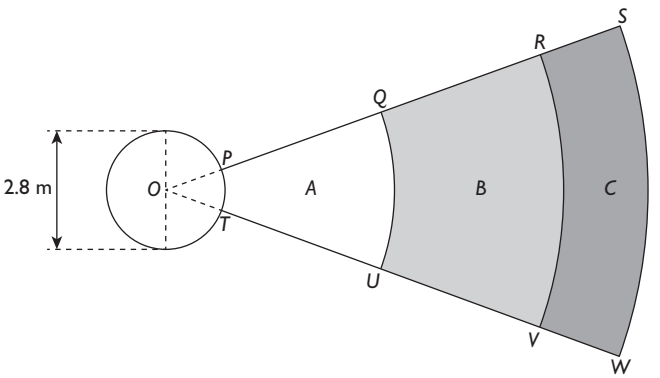
(ii)

(b) (i)

(ii)

14. Rajah 7 menunjukkan suatu lapangan arena bagi acara lontar peluru dalam kejohanan sukantara peringkat sekolah SMK Iktisam. Arena lontar peluru tersebut dibahagikan kepada tiga kawasan, *A*, *B* dan *C*. Tiada markah diberikan kepada murid yang hanya mampu melontar peluru di dalam kawasan *A*. 2 markah diberikan sekiranya murid berjaya melontar peluru masuk ke kawasan *B* dan 5 markah diberikan sekiranya peluru itu jatuh di kawasan *C*.

Diagram 7 shows an arena field for a shot put event in the SMK Iktisam school level pre-sports event. The arena is divided into three regions, A, B and C. No marks are given to students who are only able to throw the shot in region A. 2 marks are given if students successfully throw the shot into region B and 5 marks are given if the shot falls in region C.



Rajah 7/*Diagram 7*

Titik *O* ialah pusat bulatan bagi arena lontar peluru itu. Diberi $PQ = QR = 4$ m, $RS = \frac{1}{2}QR$ dan $\angle POT = 40°$.

Point O is the centre of the shot put's arena. Given $PQ = QR = 4$ m, $RS = \frac{1}{2}QR$ *and* $\angle POT = 40°$.

$\left[\text{Guna/}\textit{Use}\ \pi = \frac{22}{7}\right]$

(a) Hitung perimeter, dalam m, seluruh arena lontar peluru itu.
Calculate the perimeter, in m, *of the whole shot put's arena.*

[3 *markah*/3 *marks*]

(b) Hitung beza luas, dalam m^2, antara kawasan *B* dan *C*.
Calculate the difference in area, in m^2, *between regions B and C.*

[3 *markah*/3 *marks*]

(c) Pihak sekolah berminat untuk menaik taraf kawasan bulatan arena lontar peluru dengan menggunakan simen berwarna. Kos bahan dan upah yang diperlukan ialah sebanyak RM60 bagi setiap 1 m^2. Hitung jumlah perbelanjaan bagi menyiapkan projek itu.
The school intends to upgrade the circle area of the shot put's arena using coloured cement. The cost of the materials and wages required is RM60 *per* 1 m^2. *Calculate the total expenditure to complete the project.*

[2 *markah*/2 *marks*]

Jawapan/*Answer*:

(a)

(b)

(c)

15. (a) Lengkapkan jadual di ruang jawapan bagi persamaan $y = x^3 - 5x + 8$ dengan menulis nilai-nilai y apabila $x = -3$, $x = 0$ dan $x = 2$.
Complete the table in the answer space for the equation $y = x^3 - 5x + 8$ by writing down the values of y when $x = -3$, $x = 0$ and $x = 2$.

[3 *markah*/3 *marks*]

(b) Untuk ceraian soalan ini, gunakan kertas graf yang disediakan pada ruang jawapan. Anda boleh menggunakan pembaris fleksibel.
For this part of the question, use the graph paper provided in the answer space. You may use a flexible curve rule.

Dengan menggunakan skala 2 cm kepada 1 unit pada paksi-x dan 2 cm kepada 5 unit pada paksi-y, lukis graf $y = x^3 - 5x + 8$ untuk $-3.5 \leqslant x \leqslant 3.5$.
Using a scale of 2 cm to 1 unit on the x-axis and 2 cm to 5 units on the y-axis, draw the graph of $y = x^3 - 5x + 8$ for $-3.5 \leqslant x \leqslant 3.5$.

[4 *markah*/4 *marks*]

(c) Daripada graf di **15**(b), cari
From the graph in **15**(b), *find*

(i) nilai y apabila $x = 0.4$,
the value of y when $x = 0.4$,

(ii) nilai x apabila $x^3 - 5x + 8 = 0$.
the value of x when $x^3 - 5x + 8 = 0$.

[2 *markah*/2 *marks*]

Jawapan/*Answer*:

(a) $y = x^3 - 5x + 8$

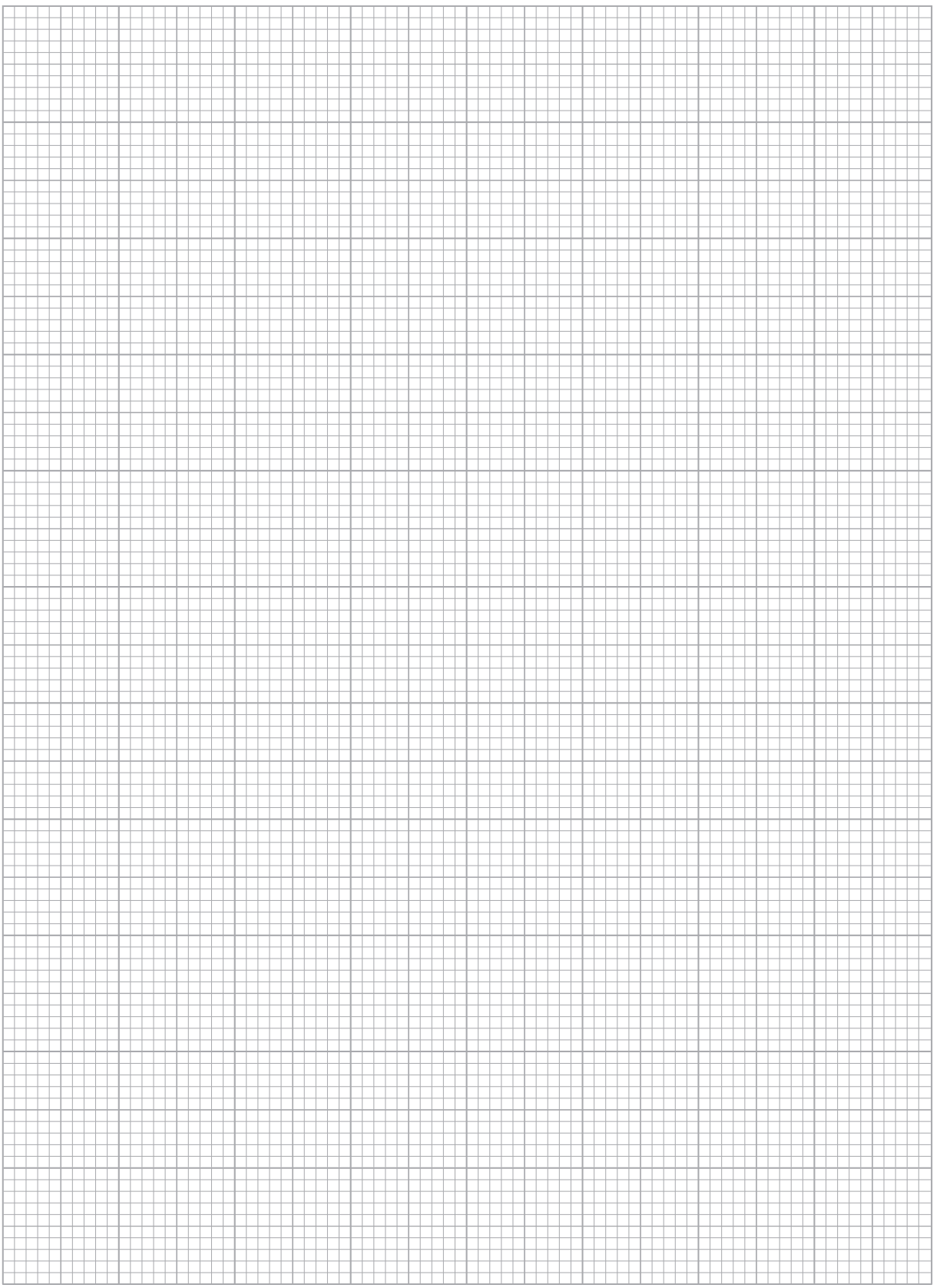
x	−3.5	−3	−2	−1	0	1	2	3	3.5
y	−17.4		10	12		4		20	33.4

(b) Rujuk graf di halaman 157.
Refer to the graph on page 157.

(c) (i)

(ii)

Graf untuk Soalan 15
Graph for Question 15



Bahagian C
Section C

[15 *markah*/15 *marks*]

Jawab mana-mana **satu** soalan daripada bahagian ini.
Answer any one *question from this section.*

16. (a) Encik Nasir merancang untuk membuka sebuah kedai menjual daging kambing dan ayam sejuk beku di kawasan perumahannya. Beliau menerima dua pakej harga borong daripada pembekal. Jadual 3.1 menunjukkan kuantiti dan jumlah harga yang diberikan oleh pembekal itu.
Encik Nasir plans to open a shop selling frozen lamb and chicken in his residential area. He received two wholesale price packages from a supplier. Table 3.1 *shows the quantities and total prices given by the supplier.*

	Kuantiti/*Quantity* (kg)		**Jumlah (RM)** *Amount* (RM)
	Kambing *Lamb*	**Ayam** *Chicken*	
Pakej *A* *Package A*	70	30	1 185
Pakej *B* *Package B*	35	60	795

Jadual 3.1/*Table* 3.1

(i) Tulis dua persamaan linear untuk mewakili situasi di atas.
Write two linear equations to represent the above situation.

[2 *markah*/2 *marks*]

(ii) Seterusnya, dengan menggunakan kaedah matriks, hitung harga bagi 1 kg daging kambing dan 1 kg ayam itu.
Hence, by using matrix method, calculate the prices of 1 kg *of lamb and* 1 kg *of chicken.*

[4 *markah*/4 *marks*]

Jawapan/*Answer*:

(a) (i)

(ii)

(b) Pada hari pertama pembukaan kedainya, Encik Nasir berjaya mendapat hasil jualan sebanyak RM200. Dalam bulan pertama, hasil jualan kedainya sentiasa meningkat pada setiap hari mengikut model persamaan linear $y = \frac{4}{5}x + 200$, dengan keadaan y ialah hasil jualan setiap hari selepas x hari. Diberi bahawa kadar hasil jualan kedai Encik Nasir pada bulan kedua adalah sama dengan bulan pertama. Beliau berjaya memperoleh hasil jualan RM308 pada hari kesepuluh dalam bulan kedua.
On the first day of opening his shop, Encik Nasir managed to get sales of RM200*. In the first month, the sales of his shop is always increasing on a daily basis according to the linear equation model* $y = \frac{4}{5}x + 200$*, where y is the daily sales after x days. Given the sales of Encik Nasir's shop in the second month is the same as the first month. He managed to obtain sales of* RM308 *on the tenth day of the second month.*

(i) Cari satu persamaan untuk mewakili hasil jualan kedai Encik Nasir pada bulan kedua.
Find an equation to represent the sales of Encik Nasir's shop in the second month.

[3 *markah*/3 *marks*]

(ii) Seterusnya, hitung jangkaan hasil jualan pada hari ke-30 dalam bulan kedua.
Hence, calculate the expected sales on the 30th *day of the second month.*

[2 *markah*/2 *marks*]

Jawapan/*Answer*:

(b) (i)

(ii)

(c) Kedai Encik Nasir telah menggunakan sebanyak 770 kWj elektrik pada bulan Oktober. Diberi bahawa penggunaan yang melebihi 600kWj dalam sebulan akan dikenakan cukai perkhidmatan sebanyak 6%. Jadual 3.2 menunjukkan tarif elektrik yang telah ditetapkan oleh pihak pembekal elektrik.
Encik Nasir's shop used 770 kWh *of electricity in October. Given the usage exceeding* 600 kWh *in a month will be subject to* 6% *service tax. Table* 3.2 *shows the electricity tariffs that have been set by the electricity supplier.*

Blok Tarif (kWj) ***Tariff block* (kWh)**	**Kadar (RM)** ***Rate* (RM)**
Bagi 200 kWj pertama *For the first* 200 kWh	0.435
Bagi kWj yang seterusnya (201 kWj ke atas) *For the next* kWh (201 kWh *onwards*)	0.509

Jadual 3.2/*Table* 3.2

(i) Hitung jumlah bayaran yang tidak dikenakan cukai perkhidmatan.
Calculate the total amount of payment which is not subjected to service tax.

[2 *markah*/2 *marks*]

(ii) Hitung jumlah bil sebenar yang perlu dibayar oleh Encik Nasir.
Calculate the actual bill to be paid by Encik Nasir.

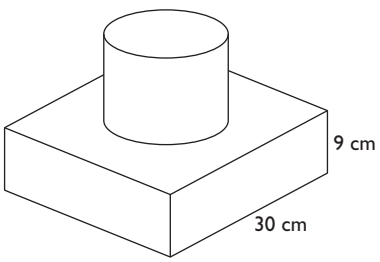
[2 *markah*/2 *marks*]

Jawapan/*Answer*:

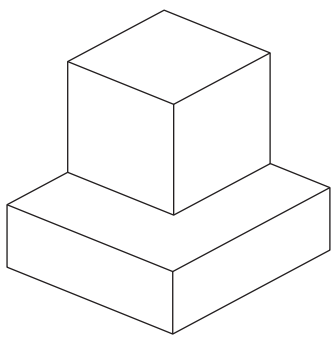
(c) (i)

(ii)

17. (a) Rajah 8.1 menunjukkan bentuk kek yang ingin ditempah oleh Encik Hafiz bagi meraikan sambutan hari jadi isterinya. Kek itu merupakan kek dua tingkat yang melibatkan sebuah kuboid dengan tapak segi empat sama dan sebuah silinder berdiameter 22 cm.
Diagram 8.1 *shows the shape of a cake that Encik Hafiz wants to order to celebrate his wife's birthday. The cake is a two-tiered cake consists of a cuboid with a square base and a cylinder with a diameter of* 22 cm.



Rajah 8.1/*Diagram* 8.1



Rajah 8.2/*Diagram* 8.2

Jumlah isi padu kek dalam Rajah 8.1 ialah 13 918 cm^3. Encik Hafiz kemudiannya ingin menukar kek berbentuk silinder itu kepada sebuah kek berbentuk kubus seperti dalam Rajah 8.2 tanpa mengubah jumlah isi padu asal kek.
The total volume of the cake in Diagram 8.1 *is* 13 918 cm^3. *Encik Hafiz then wants to change the cylindrical cake to a cube-shaped cake as shown in Diagram* 8.2 *without changing the original volume of the cake.*

$\left[\text{Guna/}\textit{Use}\ \pi = \frac{22}{7}\right]$

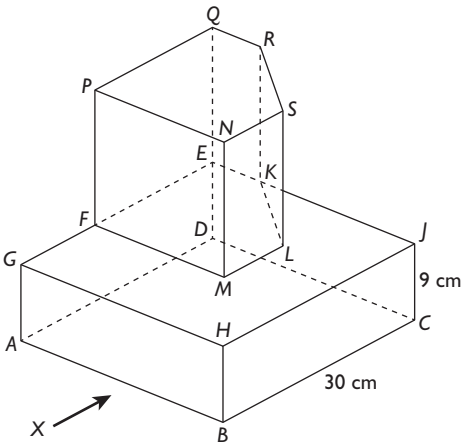
(i) Hitung tinggi, dalam cm, kek berbentuk silinder dalam Rajah 8.1. Bundarkan jawapan betul kepada 4 angka bererti.
Calculate the height, *in* cm, *of the cylindrical cake in Diagram* 8.1. *Round off the answer correct to* 4 *significant figures.*
[4 *markah*/4 *marks*]

(ii) Hitung panjang, dalam cm, sisi kek berbentuk kubus itu. Bundarkan jawapan betul kepada 2 angka bererti.
Calculate the length, *in* cm, *of the side of the cube-shaped cake. Round off the answer correct to* 2 *significant figures.*
[2 *markah*/2 *marks*]

Jawapan/*Answer*:
(a) (i)

(ii)

(b) Pada sambutan hari lahir itu, Encik Hafiz telah membuat keputusan untuk menempah kek seperti dalam Rajah 8.2. Isteri Encik Hafiz kemudiannya telah memotong bahagian pertama pada kek berbentuk kubus. Baki kek setelah potongan pertama ditunjukkan seperti dalam Rajah 8.3.
At the birthday celebration, Encik Hafiz decided to order a cake as shown in Diagram 8.2. Encik Hafiz's wife then cut the first part of the cube-shaped cake. The remaining of the cake after the first cut is shown as in Diagram 8.3.



Rajah 8.3/*Diagram 8.3*

Tepi *RK* dan *SL* adalah tegak. *NS* = *QR* = 9 cm. Dengan menggunakan skala 1 : 3, lukis dongakan kek yang tinggal itu pada satah mencancang yang selari dengan *AB*, sebagaimana yang dilihat dari *X*.
RK and SL are vertical edges. NS = QR = 9 cm. By using a scale of 1 : 3, draw the elevation of the remaining cake on a vertical plane parallel to AB, as viewed from X.

[5 *markah*/5 *marks*]

Jawapan/*Answer*:
(b)

(c) Kebarangkalian kek yang ditempah dari kedai kek itu tidak boleh dimakan selepas seminggu ialah $\frac{2}{7}$. Dua biji kek dipilih secara rawak.

The probability that a cake ordered from the bakery cannot be eaten after one week is $\frac{2}{7}$. Two cakes are randomly selected.

(i) Lengkapkan gambar rajah pokok di ruang jawapan bagi menunjukkan semua kesudahan yang mungkin.
Complete the tree diagram in the answer space to show all the possible outcomes.

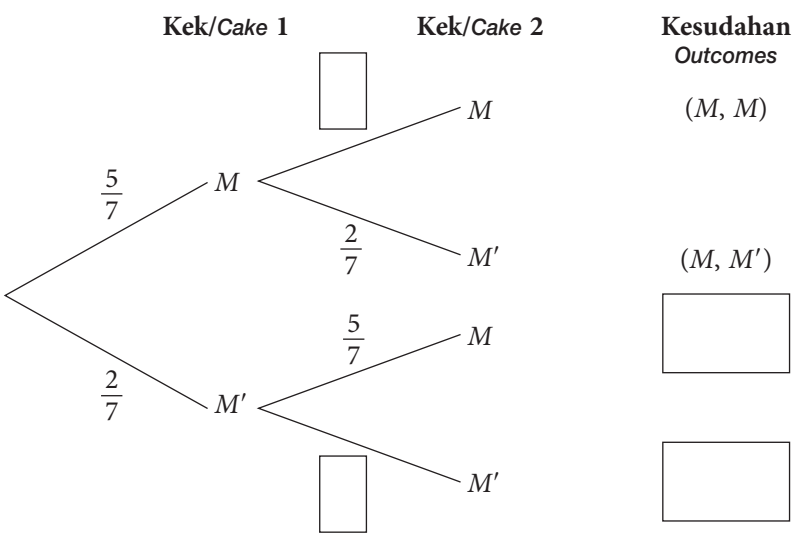
[2 *markah*/2 *marks*]

(ii) Hitung kebarangkalian bahawa sekurang-kurangnya sebiji kek yang dipilih tidak boleh dimakan selepas seminggu.
Calculate the probability that at least one selected cake cannot be eaten after one week.

[2 *markah*/2 *marks*]

Jawapan/*Answer*:

(c) (i)



M = Boleh dimakan/*Can be eaten*
M' = Tidak boleh dimakan/*Cannot be eaten*

(ii)

KERTAS PEPERIKSAAN TAMAT
END OF QUESTION PAPER